

DR. EVA C. HERBST

PERSONAL INFORMATION

ADDRESS: Palaeontological Institute and Museum
Karl-Schmid-Strasse 4, 8004 Zurich, Switzerland

EMAIL: eva.herbst@pim.uzh.ch

[GoogleScholar](#) - [Github](#) - [Figshare](#) - [Morphosource](#) - [Publons](#)

EDUCATION

2016 - 2020 PhD in Biomechanics and Palaeontology
Structure and Motion Lab, Royal Veterinary College, London
Supervisors: Prof. John R. Hutchinson and Dr. Chris Richards

2012 - 2016 B.A. in Integrative Biology
U.C. Berkeley

2013 - 2014 Degree of Higher Education in Biomedical Sciences
Durham University
Year of Study Abroad, Certificate of Higher Education

EMPLOYMENT AND RESEARCH EXPERIENCE

2019 - PRESENT Postdoc Palaeontological Institute and Museum, University of Zurich
investigating form and function of Triassic reptile skulls

2019 - PRESENT Lead Researcher OATech+ Network Pump Priming Project
analysing bony architecture to monitor osteoarthritis of the knee

2019 OATech+ Network Early Career Researcher Placement
osteoarthritis project, Prof. Andrew Pitsillides, Royal Veterinary College, London

2016 - 2020 PhD in Palaeontology and Biomechanics
Structure and Motion Lab, Royal Veterinary College, London

2016 National Science Foundation Research Experience for Undergraduates Project
Comparative Biomechanics, Palaeontology, and Evolution, University of Missouri

2015 - 2016 Undergraduate Research Apprenticeship Program
Hummingbird Flight Analysis, U.C. Berkeley

2014 - 2016 Research Assistant and Archivist
Human Evolution Research Center, U.C. Berkeley

2013 - 2016 Research Intern and Staff
Safari West Osteology, Santa Rosa, California

2014 - 2015 Undergraduate Research Apprenticeship Program
Rodent Mandible Morphology Project, U.C. Berkeley

HONORS AND AWARDS

- 2021 **D. Dwight Davis Award, Society of Integrative and Comparative Morphology**
Best student oral presentation in the Division of Vertebrate Morphology
- 2020 **Swiss Commission of Palaeontology Prize**
Best presentation in palaeontology given at the Swiss Geoscience Meeting
- 2016 **Franklin M. Henry Award, Integrative Biology, UC Berkeley**
Outstanding achievement in human performance and health research
- 2016 **Distinction in General Scholarship, UC Berkeley**
Awarded to graduates achieving high grade point average
- 2013, 2015 **Dean's Honors, UC Berkeley**
Awarded to graduates achieving high grade point average

PEER-REVIEWED PUBLICATIONS

- 2021 **Herbst, E. C.**, Lautenschlager, S., Bastiaans, D., Miedema, F., Scheyer, T. M. Modeling tooth enamel in FEA comparisons of skulls: comparing common simplifications with biologically realistic models. *Accepted for publication in [iScience](#)*
- 2021 **Herbst, E. C.**, Felder, A. A., Evans, L. A. E., Ajami, S., Javaheri, B., Pitsillides, A. A. A new straightforward method for semi-automated segmentation of trabecular bone from cortical bone in diverse and challenging morphologies. *Royal Society Open Science* 8(8)
- 2020 Ortega-Jimenez, V. M., **Herbst, E. C.**, Leung, M. S., and Dudley, R. Natural barriers: waterfall transit by small flying animals. *Royal Society Open Science* 7201185
- 2019 **Herbst, E. C.**, Doube, M., Smithson, T. R., Clack, J., and Hutchinson, J. R. Bony lesions in early tetrapods and the evolution of mineralized tissue repair. *Paleobiology* 45(4)
- 2010 **Herbst, E. C.** and Hutchinson, J. R. New insights into the morphology of the Carboniferous tetrapod *Crassigyrinus scoticus* from computed tomography. *Earth and Environmental Science Transactions of The Royal Society of Edinburgh* 109(1-2)

GRANTS AND FUNDING

- 2020 **University of Zurich GRC Grant**
Project: organized and hosted finite element analysis [seminar series and workshop](#) with over 200 participants and developed a [website](#) and [Github organisation](#) for sharing finite element modeling methods
Funds: 10,000 CHF
- 2019 **OATech+ Biomechanics and Mechanobiology Pump Priming Fund**
Project: Using 3D trabecular architecture as a biomarker to identify and monitor osteoarthritis of the knee
Funds: 10,000 GBP

GRANTS AND FUNDING CONT.

- 2019 **OATech+ Next Generation of OATech Leaders Fund**
Placement with Prof Andrew Pitsillides at RVC to work on osteoarthritis project (see above)
Funds: 3,000 GBP
- 2019 **Royal Veterinary College Foreign Travel Fund**
To present research at ICVM conference
Funds: 300 GBP
- 2018 **Royal Veterinary College Foreign Travel Fund**
To present research at SICB conference
Funds: 300 GBP
- 2016 **Research Experience for Undergraduates, National Science Foundation**
Biomechanics research internship with Prof. Casey Holliday and Prof. Kevin Middleton, University of Missouri
Funds: 3,500 USD

INVITED TALKS AND WORKSHOP

- 2021 *Motion capture and computational approaches to investigate joint range of motion*
Palaeontology Discussion Group, University of Birmingham, UK.
- 2021 *Workshop: [how to clean 3D meshes in Blender](#)*
[FunkyMUG](#) (Functional Morphology Users Group). Online. [Recording available on Youtube](#)
- 2021 *New methods support the possibility of a salamander-like walk in the Permian tetrapod Eryops*. Comparative Zoology Lab, Humboldt University Berlin, and Natural History Museum Berlin, Germany.
- 2020 *Investigating joint range of motion in salamanders and early tetrapods*.
Evolutionary Morphology and Biomechanics Group, University of Liverpool, UK.
- 2019 *Computational analysis of the evolution of amphibian locomotor modes*.
Postgraduate Research Day, Final Year PhD Session, Royal Veterinary College, London.
- 2017 *Functional morphology of Crassigyrinus scoticus: gaining insight into locomotor evolution in early tetrapods*.
Postgraduate Research Day, Royal Veterinary College, London. (Poster)
- 2017 *Computational analysis of the evolution of amphibian locomotor modes*.
Postgraduate Seminar Series, Royal Veterinary College, London.

CONFERENCE PRESENTATIONS

* denotes co first author, first author listed = presenting author

- 2021 **Herbst, E. C., Lautenschlager, S., Fioritti, N., Meade, L., Scheyer, T.M.** 2021.
Modelling muscle volumes for finite element analysis and multibody dynamics
XVIII International Symposium on Computer Simulation in Biomechanics. Online. (Talk)

CONFERENCE PRESENTATIONS CONT.

- 2021 Evans, L. A. E.*, **Herbst, E. C.***, Felder, A. A., Ajami, S., Jahaveri, B., Pitsillides, A. A. *Do 3D epiphyseal bone architectural changes in ageing STR/Ort and healthy mice reveal early imaging biomarkers of osteoarthritis?* Society Annual Meeting. Online. (Talk, winner of New Investigator Award)
- 2021 **Herbst, E. C.**, Eberhard, E., Manafzadeh, A. R., Richards, C., Hutchinson, J. R. *New methods support the possibility of a salamander-like walk in the Permian tetrapod Eryops*. Society for Integrative and Comparative Biology Annual Meeting, Online. (Talk, winner of D. Dwight Davis Award Session)
- 2021 **Herbst, E. C.**, Bastiaans, D., Miedema, F., Scheyer, T. M., Lautenschlager, S. 2021. *How important is modeling tooth enamel in FEA comparisons of whole skulls? Comparing common simplifications with biologically realistic models*. Society for Integrative and Comparative Biology Annual Meeting, Online. (Poster)
- 2021 Bastiaans, D., **Herbst, E. C.**, Scheyer, T. M. Bringing fossils back to life: 3D cranial reconstructions of the highly flattened remains of thalattosauriformes. Society for Integrative and Comparative Biology Annual Meeting, Online. (Talk)
- 2020 **Herbst, E. C.**, Eberhard E., Manafzadeh A. R., Richards C., Hutchinson J. R. 2020. Was the early tetrapod *Eryops* capable of a salamander-like walk? Developing new methods to test paleontological hypotheses about posture and gait. Swiss Geosciences Meeting, Online. (Talk, winner of Swiss Commission of Palaeontology Prize)
- 2020 Bastiaans, D., **Herbst, E. C.**, Scheyer, T. M. Re-fleshing fossils: cranial reconstructions of thalattosauriformes. Swiss Geosciences Meeting, Online. (Talk)
- 2020 Bastiaans, D., **Herbst, E. C.**, Webb, N. M., Haeusler, M. Scheyer, T. M. 3D Data, a gateway to open science: the FEZ initiative. OILS (Open Innovation in Life Sciences), Online. (Talk)
- 2020 Bastiaans, D., **Herbst, E. C.**, Scheyer, T. M. Virtual paleontology: a modern look at ancient material OILS (Open Innovation in Life Sciences), Online. (Talk)
- 2020 Bastiaans, D., **Herbst, E. C.**, Scheyer, T. M. Thalattosauriformes: schedelreconstructies van Triassische weirdos. NKVP (Nederlandse Kring van Vertebraten Paleontologen), Online (Talk).
- 2020 **Herbst, E. C.**, Felder, A. A., Evans, L. A. E. , Jahaveri, B., Ajami, S., Pitsillides, A. A. A new automated method of segmenting trabecular bone: investigating subchondral trabecular changes as a predictor of osteoarthritis at the joint surface. Bone Research Society Annual Meeting, Online. (Poster)
- 2020 **Herbst, E. C.**, Eberhard, E., Richards, C., Hutchinson, J. R. Comparing in vivo and ex vivo knee range of motion in salamanders: a new method for investigating joint mobility. CAMS-Knee OpenSim Workshop, ETH, Zürich. (Poster)
- 2019 **Herbst, E. C.**, Eberhard, E. A., Richards, C. T., Hutchinson, J. R. 2019. A new method for investigating joint mobility and its relevance for inferring locomotor evolution in early tetrapods. 12th International Congress of Vertebrate Morphology, Prague, Czech Republic, abstract doi:10.1002/jmor.21003 (Talk)

CONFERENCE PRESENTATIONS CONT.

- 2018 **Herbst, E. C.**, Doube, M., Smithson, T. R., Clack, J., Hutchinson. J. R. Paleopathologies in Carboniferous tetrapods and the evolution of bone healing. Society of Vertebrate Paleontology, 78th Annual Meeting, Albuquerque, New Mexico. (Poster)
- 2018 C. M. Holliday, **Herbst, E. C.**, M. Jacoby, A. Smolinsky, K. Sellers. Morphometric and modeling approaches to understanding the evolution of pseudosuchian mandibular symphyses. Society of Vertebrate Paleontology, 78th Annual Meeting, Albuquerque, New Mexico. (Talk)
- 2018 **Herbst, E. C.** 2018. New elements discovered in the early tetrapod *Crassigyrinus scoticus*. DVM SICB Regional Meeting, Natural History Museum, London. (Talk)
- 2018 **Herbst, E. C.**, Smithson, T. R., Clack, J., Doube, M., Hutchinson. J.R. Bony lesions in early tetrapods and the evolution of bone healing. Society of Integrative and Comparative Biology Annual Meeting, San Francisco. (Talk)
- 2018 **Herbst, E. C.**, Smithson, T. R., Clack, J., Doube, M., Hutchinson. J.R. Bony lesions in early tetrapods and the evolution of bone healing. Society of Integrative and Comparative Biology Annual Meeting, San Francisco. (Talk)
- 2017 **Herbst, E. C.** and Hutchinson, J. R. New insights into the morphology of the Carboniferous tetrapod *Crassigyrinus scoticus* gleaned from computer tomography. The Early Tetrapod World: a one-day conference celebrating the career of Prof Jenny Clack FRS. University of Cambridge. (Invited Conference Talk)
- 2017 **Herbst, E. C.**, Smithson, T. R., Clack, J., Hutchinson. J. R 2017. Pathology in the early tetrapod *Crassigyrinus scoticus*. Progressive Palaeontology Annual Meeting, University of Leicester. (Talk)

TEACHING

Teaching Positions

- 2021 Bio 262 Evolutionary Morphology of Vertebrates - Issues and Methods
University of Zurich
- 2020 Bio 267, Paleobiology and Evolution of Vertebrates, University of Zurich
- 2016-2019 Research Skills Facilitator, Royal Veterinary College, London
- 2017-2018 Comparative Animal Locomotion Module, Royal Veterinary College, London

Lectures

- 2021 *Using Computer Tools to Investigate Biomechanics of Animals.*
Bio 262, University of Zurich
- 2020 *Using Computer Modeling to Investigate Biomechanics of Extinct Animals.*
Bio267, University of Zurich

Tutoring

- 2017 - 2019 Postgraduate Writing Tutor, Royal Veterinary College, London
- 2011 - 2012 Private Tutor (Writing, Math)

TECHNICAL SKILLS AND PROGRAMS

CT SEGMENTATION AND 3D MODELING	Mimics, Avizo, Blender, Rhino
ANALYSIS AND SCRIPTING	Matlab, Python, Java
FINITE ELEMENT ANALYSIS & MULTIBODY DYNAMICS	Hypermesh, Abaqus, Artisanth
SCIENTIFIC ROTOSCOPING AND ANIMATION	Maya

OPEN ACCESS WORK

- SHARED WORKFLOWS • method for [automatic segmentation of trabecular bone](#)
 • [Blender remeshing guide](#) for FEA
- FEZ INITIATIVE Founder of [Finite Element Zurich](#)
- CT DATA CT stacks used in my papers are open access on [Figshare](#)
- 3D MODELS 3D Models I created are available on [Morphosource](#)
- OPEN ACCESS COURSE Completed [Open Life Science Program](#) fall 2020

OUTREACH

- 2020 [Interview](#) with Real Scientists DE (in German)
- 2019 Outreach display, Early Tetrapod Evolution
 Night at the Vet College, Royal Veterinary College, London
- 2017 Outreach display, Early Tetrapod Evolution
 Annual Open Day, Royal Veterinary College, London
- 2017 Guest [blog post](#) about *Crassigyrinus* on Anatomy to You blog
- 2013-2016 Comparative anatomy outreach events at Safari West Wildlife Park

PROFESSIONAL DEVELOPMENT AND CERTIFICATES

- 2021 [Scientific Programming with Python](#), Physics Department, UZH
- 2020 [Open Life Science Course](#)
- 2020 [SlicerMorph 3D Morphometrics Course](#)
- 2019 Avizo Course 3DMAGINATION Ltd.
- 2018 MatLab Fundamentals Course
- 2017 Teaching and Learning in Higher Education Certificate Royal Veterinary College, London

LANGUAGES

ENGLISH: fluent
GERMAN: fluent